WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2005ME43B

Title: A Pilot Study to Evaluate the Potential for River Water Toxicity to Increase Following Dam Removal

Project Type: Research

Focus Categories: Sediments, Toxic Substances, Water Quality

Keywords: Fish, Pollutants, Dams, Penobscot, River

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Abstract

There has been a precipitous decline in anadromous fish populations, with Atlantic salmon (Salmo salar) populations in 8 Maine rivers listed as endangered in 2000. Dam removal has been identified as the most important strategy for restoring salmon populations in Maine and two dams on Penobscot River, Great Works Dam and Veazie Dam, have been designated for removal. Dam removal can result in release of contaminants from riverine sediments into overlying waters, potentially increasing water toxicity to resident species, including anadromous fish. Because dams will be removed as

part of the Penobscot River Restoration Project, there is a need to evaluate the toxic potential of Penobscot River sediments prior to dam removal (dam removal will start no sooner than 2007, http://www.penobscotriver.org/faq.html). We will use a simple laboratory-based, sediment resuspension design and two well-established aquatic toxicology models, fathead minnows (Pimephales promelas) and zebrafish (Danio rerio), to evaluate if resuspension of Penobscot River sediment significantly elevates the toxicity of river water as measured by fish survival, hatch success, development, and immune competence, whether bioactive metals and/or endocrine disrupting substances are present, and to provide preliminary information on the types of chemicals likely to desorb during resuspension.